



# Audit Report

OFFICE OF THE INSPECTOR GENERAL

**ADVISORY REPORT ON MAJOR WEAPON SYSTEM  
ACQUISITIONS**

Report Number 92-047

February 14, 1992

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**The following acronyms are used in this report.**

ACE . . . . .	Armored Combat Earthmover
ARPRO . . . . .	Army Plant Representative Office
CAAS . . . . .	Contracted Advisory and Assistance Services
CSE . . . . .	Common Support Equipment
DFARS . . . . .	DoD Federal Acquisition Regulation Supplement
FAR . . . . .	Federal Acquisition Regulation
ERIS . . . . .	Exoatmospheric Reentry-Vehicle Interceptor System
GBRP . . . . .	Ground Based Radar Program
HEMTT . . . . .	Heavy Expanded Mobility Tactical Truck
IFF . . . . .	Identification Friend-or-Foe System
LANTIRN . .	Low Altitude Navigation and Targeting Infrared System for Night
OMB . . . . .	Office of Management and Budget
SINCGARS . . . .	Single Channel Ground and Airborne Radio System
SURTASS . . . . .	Surveillance Towed Array Sensor System
SWATH-TAGOS. .	Small Waterplane Area Twin Hull Ocean Surveillance Ships
TEMP . . . . .	Test and Evaluation Master Plan
TOW . . . . .	Tube-Launched, Optically-Tracked, Wire-Guided



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
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ARLINGTON, VIRGINIA 22202-2884



February 14, 1992

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION  
ASSISTANT SECRETARY OF THE ARMY  
(FINANCIAL MANAGEMENT)  
ASSISTANT SECRETARY OF THE NAVY  
(FINANCIAL MANAGEMENT)  
ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)  
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Advisory Report on Major Weapon System Acquisitions  
(Report No. 92-047)

We are providing this final report for your information and use. Because there were no recommendations, we did not request management comments on the draft of this report and none were received.

If you have any questions regarding this advisory report, please contact Mr. Thomas F. Gimble, Deputy Director, Acquisition Management Directorate, at (703) 614-1414 (DSN 224-1414). The planned distribution of this report is listed in Appendix C.

*Robert J. Lieberman*  
Robert J. Lieberman  
Assistant Inspector General  
for Auditing

Enclosure

cc:  
Secretary of the Army  
Secretary of the Navy  
Secretary of the Air Force

OFFICE OF THE INSPECTOR GENERAL

AUDIT REPORT NO. 92-047  
(Project No. IAM-0034)

February 14, 1992

MAJOR WEAPON SYSTEM ACQUISITIONS

EXECUTIVE SUMMARY

**Introduction.** As of March 31, 1991, DoD had approximately 100 active major acquisition programs with a total value of \$838 billion. The magnitude of the programs and the potential impact on national security make this an area of great interest to top-level national leaders.

The Office of the Inspector General, Department of Defense, has audit oversight for weapon system acquisitions within the DoD. To audit weapon system acquisitions in an objective, systematic, and consistent manner, the Assistant Inspector General for Auditing tasked his staff with developing an audit approach that would determine whether a major acquisition program was on the right track at any point in the acquisition cycle.

In June 1988, the Assistant Inspector General for Auditing issued the audit guide, "Critical Management Elements For Auditing Major Acquisition Programs," which became the basis for audits of 17 weapon system acquisitions. These 17 audits resulted in 19 audit reports, which are listed in Appendix A.

**Objective.** This project was performed to identify systemic issue areas related to the acquisition of major weapon systems. The review summarizes the issues identified in audit reports issued since 1988 by the Office of the Inspector General, Department of Defense.

**Results of Review.** Our analysis of the 19 audit reports on the 17 weapon system acquisitions showed that the reported problems most often resulted from the program offices' lack of adherence to existing policies and procedures rather than from a lack of established policies and procedures. Our summary of audit reports issued from November 1988 to December 1990 indicates that problems persist in nine areas.

- o Test and evaluation issues included poor Test and Evaluation Master Plans, insufficient scope of testing, and improper scoring and interpreting of test results.
- o Program management deficiencies included failure to properly monitor contractors, use of ineffective procurement strategies, and use of ineffective internal communications.
- o Contracting issues included inadequate contract administration and contracting for outside personnel to perform functions that should have been reserved for Government employees.
- o Logistics planning issues included insufficient training of personnel, inadequate support funding, and inadequate technical data packages.
- o Configuration management issues included inadequate configuration planning and failure to control configuration changes.
- o Scheduling issues included poor contractor planning and inadequate management oversight.
- o Component breakout issues included the program offices not properly following requirements.
- o Warranty issues included the program offices not aggressively obtaining and enforcing warranties.
- o Internal control issues included program management's lack of compliance with regulations.

Conclusion. Although this report contained no recommendations that required management response, the recurrence of the above issues demonstrates the need for continued management oversight and emphasis.

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This report was prepared by the Acquisition Management Directorate, Office of the Assistant Inspector General for Auditing, DoD. Copies of this report can be obtained from the Information Officer, Audit Planning and Technical Support Directorate, (703) 693-0340.

## PART I - INTRODUCTION

### Background

DoD Directive 5000.1, "Defense Acquisition," February 23, 1991, and DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," February 23, 1991,\* establish the policies and procedures for managing Defense acquisitions. These instructions establish a disciplined management approach for acquiring systems and materiel that satisfy the user's needs. The approach that these instructions establish integrates the efforts and products of DoD's requirements generation; acquisition management; and planning, programming, and budgeting systems.

These instructions define an acquisition program as a directed, funded effort that is designed to provide a new or improved material capability in response to a validated need. The Under Secretary of Defense for Acquisition designates a program as a major acquisition when it is estimated to require:

An eventual total expenditure for Research, Development, Test, and Evaluation of more than \$200 million in fiscal year 1980 constant dollars (approximately \$300 million in fiscal 1990 constant dollars), or

An eventual total expenditure for procurement of more than \$1 billion in fiscal year 1980 constant dollars (approximately \$1.8 billion in fiscal 1990 constant dollars).

As of March 31, 1991, there were approximately 100 active major acquisition programs in DoD. To audit weapon system acquisitions in an objective, systematic, and comparable manner, the Assistant Inspector General for Auditing tasked members of his staff with developing an audit approach that would determine whether a major acquisition program was on the right track at any point in the acquisition cycle. Additionally, the approach would improve the consistency of weapon system audits, which would generate data that would be useful for trend analysis.

In June 1988, the Assistant Inspector General for Auditing issued the audit guide, "Critical Program Management Elements For

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\* DoD Directive 5000.1 and DoD Instruction 5000.2 were significantly revised and reissued on February 23, 1991. The audit reports summarized in this report were performed using the previously existing regulatory criteria.

Auditing Major Acquisition Programs." The guide contained a list of issues that were pertinent for potential review for an acquisition depending on the phase of the acquisition cycle. The guide has been used to audit 17 weapon system acquisitions. These 17 audits resulted in 19 audit reports (Appendix B).

When the audit guide was developed, major weapon system acquisitions in DoD generally followed phases of Concept Exploration/Definition, Concept Demonstration/Validation, Full-Scale Development and Low-Rate Initial Production, and Full-Rate Initial Production and Deployment and Operational Support. Each phase is preceded by a Defense Acquisition Board milestone review and decision, which is intended to preclude DoD from becoming over invested or obligated in a particular solution to a Defense deficiency before the sponsoring Military Department has demonstrated that the proposed solution is the best approach and the program is ready for the next development phase.

For purposes of program evaluation Concept Demonstration Validation, Full-Scale Development, and Production and Deployment were divided into early and late phases. Members of the OAIG-AUD staff with acquisition management and auditing experience in conjunction with the professors at the Defense Systems Management College joined together to identify the most significant issues for determining program success for each acquisition phase. A list of auditable issues was developed for each of the seven phases of system acquisition. The guide is being revised to reflect the recent changes in DoD Directive 5000.1 and DoD Instruction 5000.2.

### Objective

The objective of this research and analysis project was to identify systemic issue areas related to the acquisition of major weapon systems.

### Scope

This advisory report summarizes the results of 19 audit reports resulting from the audits of 17 weapon systems. The 19 reports were issued between November 1988 and December 1990. A list of the 19 reports is in Appendix A. The issues discussed in the audit reports were grouped into nine issue areas, which are discussed in Part II of this report. The nine issue areas are test and evaluation, program management, contracting, logistics planning, configuration planning, scheduling, component breakout, warranties, and internal controls.

## PART II - RESULTS OF REVIEW

### A. OVERALL PERSPECTIVE

This advisory report summarizes the results of 19 audit reports that identified trends that were persistent in acquisition management of major weapon systems. This report contains no new recommendations since new acquisition guidance was issued February 23, 1991, after 19 audit reports were issued.

The 19 reports contained 51 findings and 29 other matters of concern for a total of 80 problems or potential problems. The reports contained 155 recommendations for management improvements. Most of the recommendations were made to correct specific deficiencies at the program level; however, the reports also contained recommendations to increase compliance across several programs within DoD. Each of the 155 recommendations was processed in accordance with DoD Directive 7650.3. All the issues and recommendations have been resolved and are in the audit follow-up process.

The persistent recurrence of the issues demonstrated a continuing need for management oversight of the acquisition process. The following sections discuss 9 recurring issues that were most prevalent in the 19 reports.

#### 1. TEST AND EVALUATION

##### Overview

Test and evaluation on 10 of the 17 systems was deficient in some aspect. The reports included recommendations to develop approved Test and Evaluation Master Plans (TEMP), simulate realistic operational conditions by appropriately scoping the tests, and properly score and interpret the test results.

##### Background

Public law and DoD policy require that weapon systems being acquired be properly tested and evaluated. The requirements for test and evaluation are contained in United States Code (U.S.C.), title 10, section 2399, and are further implemented by DoD Instruction 5000.2. DoD Instruction 5000.2 states that a properly designed and executed test and evaluation program should be structured to:

- o provide essential information for assessment of acquisition risk,
- o verify attainment of technical performance specifications and objectives,

o verify that systems are effective and suitable for their intended use, and

o provide essential information in support of decisionmaking.

The primary document used to plan and perform test and evaluation is the TEMP. TEMPs are required for all acquisition programs and provide the framework to generate test and evaluation requirements for a specific weapon system. Additionally, TEMPs document schedule and resource implications associated with test and evaluation programs. Some of the test and evaluation problems that were reported are discussed below.

#### Planning For Test And Evaluation

We reported that six systems had TEMPs that did not meet the requirements specified in DoD Instruction 5000.2. For example, in Report No. 90-042, "Acquisition Management of Small Waterplane Area Twin Hull Ocean Surveillance Ships," March 1, 1990, we reported that the Navy did not plan to accomplish the required operational test and evaluation. The situation occurred because the Assistant Secretary of the Navy (Shipbuilding and Logistics) did not follow DoD guidance and waived operational testing. The Navy planned to test the ships when the mission equipment was added. These planned actions satisfied our concerns.

In Report No. 89-075, "Quick Reaction Report on Operational Testing for the Single Channel Ground and Airborne Radio System (SINCGARS)," May 16, 1989, we reported that the Army had planned to enter full-rate production before getting the required test certifications from the Director, Operational Test and Evaluation. U.S.C., title 10, section 2399, requires that the Director, Operational Test and Evaluation, certify that the weapon system has met the established performance parameters and fulfills its intended purpose before entering into full-rate production.

#### Execution Of The Test And Evaluation Program

Examples of problems in the execution of the test and evaluation programs range from use of nonrepresentative sampling methods, to invalid test scoring, to scope limitations. For example, in Report No. 90-111, "Development and Operational Testing for the Tube-Launched Optically-Tracked, Wire-Guided (TOW 2B) Missile System," September 21, 1990, we reported that the Army had limited the scope of the testing for the TOW 2B. The development and operational test plan was not adequate to demonstrate all of the missile's operational and technical specifications. The situation occurred because the Army did not include tests to properly demonstrate the missile's effectiveness against all probable threats in a battlefield environment.

The Army's reliability acceptance program for the SINCGARS was not predictive of the true mean time between failures. The condition occurred because the Army modified the test plan; used nonstatistical sampling methods; and excluded preliminary, intermittent, unverified test failures from the scoring. We recommended, and the Army agreed to conduct, an investigation of alternative test plans for potential application to future production contracts.

## **2. PROGRAM MANAGEMENT**

### **Overview**

Ten of the seventeen weapon system acquisitions reviewed had a total of 13 deficiencies in program management. The deficiencies included failure to properly monitor contractor activities, develop effective procurement strategies, and develop effective internal communications. The audit reports contained specific recommendations to correct the deficiencies and improve the overall management of weapon system acquisitions.

### **Background**

DoD Directive 5000.1 and DoD Instruction 5000.2 contain the policies and procedures for managing Defense acquisitions. These policies are supplemented by Federal Acquisition Regulation (FAR), section 42.302, "Contract Administration Functions," and part 46, "Quality Assurance."

### **Monitoring of Contractors**

Monitoring of contractor's performance was not effective for 6 of the 17 weapon system acquisitions reviewed. For example, in Report No. 90-002, "Acquisition of the M9 Armored Combat Earthmover Program (ACE)," October 6, 1989, we reported that the Army did not ensure that the technical manuals were completely validated and verified or that contract administration of the technical support contract was adequately performed. As a result, adequate technical manuals were not available to the Army to complete its training plan and to support the planned M9 ACE fielding date of October 1989.

We reported another example of inadequate contractor monitoring in Report No. 89-101, "Acquisition of the Exoatmospheric Reentry-Vehicle Interceptor Subsystem," August 18, 1989. The report stated that the Government had not adequately monitored the contractor's internal independent verification and validation program for software development. As a result, the Government unnecessarily assumed a greater risk of accepting nonfunctioning software.

### Procurement Strategy

The procurement strategy for four weapon system acquisitions was not effective. For example, in Report No. 89-077, "Acquisition of the V-22 Joint Services Advanced Vertical Lift Aircraft (OSPREY)," June 14, 1989, we reported that the Naval Air Systems Command's strategy of having two sources compete for production contracts was no longer cost-effective. Our analysis showed that the reduced procurement quantity was insufficient to enable the Government to recoup the investment costs required to set up two competing sources. Based on our analysis, we concluded that competition was not likely to produce cost benefits to the Government that were previously projected, and that sole-source teaming procurement would be a better strategy.

We reported another example of a procurement strategy weakness in Report No. 90-021, "Acquisition of the Heavy Expanded Mobility Tactical Truck (HEMTT)," December 26, 1989. We questioned the Army's need to procure 1,122 HEMTTs with a self-recovery winch on the planned 1989 buy. We recommended that the Army review the requirement for the winch on all 1,122 vehicles. The Army concurred, conducted the review, and deleted the winch requirements on 491 trucks. The resulting cost savings were about \$3 million.

### Communications

Two weapon system acquisitions had weaknesses in the area of internal communications. For example, in Report No. 91-005, "Acquisition of the MARK XV Identification Friend-or-Foe System," October 12, 1990, the Army requirements for the Mark XV were not sufficiently definitized to provide for realistic cost estimates. The Army did not update the program baseline requirements and cost estimates to include attack helicopters and other aircraft that could use the Mark XV system. The conditions that were identified in the report were subsequently overcome by events because the program was terminated.

## 3. CONTRACTING

### Overview

The Office of the Inspector General (OIG) reviewed contracting on 13 of the 17 weapon systems. Twelve deficiencies were reported on 9 of the 13 systems. The deficiencies included failure to obtain cost and pricing data and using contractors to perform functions that should have been reserved for Government employees. The report's recommendations included allocating adequate staffing to perform the required functions, obtaining cost and pricing data and performing cost analyses, reviewing service contract actions to determine if they are performed by contractors because of personnel shortages and if they are personal in nature, and reconciling contract line items with total contract cost.

## Background

The FAR contains the Government-wide policy for acquisitions. The contract administration and contracted advisory and assistance services (CAAS) problems reported on the nine systems were the result of noncompliance with the applicable sections of the FAR.

FAR, section 15.8, "Price Negotiation," requires that cost or pricing data submitted by an offeror or contractor enable the Government to perform cost or price analyses and ultimately enable the Government and the contractor to negotiate fair and reasonable prices. Additionally, the FAR requires that the contracting officer perform a price analysis to ensure that the overall price offered is fair and reasonable.

FAR, section 37.104, distinguishes between admissible nonpersonal service contracts and personal service contracts. The FAR defines a personal service contract as being characterized by creating an employer-employee relationship between the Government and the contractor's personnel. The FAR also prohibits agencies from awarding personal services contracts unless specifically authorized by U.S.C., title 5, section 3109.

CAAS contracts are nonpersonal service contracts. The policies governing CAAS are further detailed in DoD Directive 4205.2, "DoD Contracted Advisory and Assistance Services," January 27, 1981, which states that CAAS contracts will not be used to bypass personnel ceilings. The Directive also states that DoD shall establish and maintain organic resources to perform basic governmental functions, such as, planning, policy development, interpretation and enforcement, program and budget decisionmaking, and financial accountability.

## Contract Administration

The OIG has reviewed contract administration and the use of consultants on 13 weapon systems acquisitions using the program management element approach. The OIG reported contracting problems on nine systems, and on the remaining four systems no reportable problems were observed in the area of contracting.

Seven weapon system acquisitions did not meet the Contract Administration requirements established by the FAR. For example, Report No. 90-002 stated that the Army and the Defense Logistics Agency contracting officers had not ensured that modifications to the M9 ACE production contract were being awarded at fair and reasonable prices. For the three contract modifications we audited, the contracting officers did not obtain certified cost or pricing data, as required by FAR, section 15.804, and did not perform adequate cost analyses, as required by FAR, section 15.805. In addition, the procuring contracting officer did not request field pricing support for contract modification P00004, as required by DoD Federal Acquisition Regulation Supplement

(DFARS) 215.805-5. As a result, two of the three modifications were not awarded for fair and reasonable prices.

The Army Plant Representative Offices (ARPRO) at two contractor sites were not adequately performing contract administration services, as required by the FAR and a memorandum of agreement between the Osprey Program Manager (Navy) and the ARPRO commanders (Report No. 89-077). The problem was caused by the Army not fully staffing the ARPROs to provide all of the contract administration support functions required by the FAR. The Navy relied on the ARPROs to perform all contract administration functions required by the FAR. Additionally, the problem was worsened by reductions in the Army's operational and maintenance budgets, which further impaired the ARPRO's mission capabilities. As a result of the Army not fully staffing and funding the ARPROs, the administration of the Navy's Osprey contract was not being adequately supported.

In Report No. 90-021, on the HEMTT, we reported that the cost for the individual contract line items on the multiyear contract did not reconcile to the total contract cost. One of the contributing factors was that all of the definitized modifications had not been entered into the contract status reporting system. The procurement contracting officer assigned someone to reconcile the modifications with the total contract cost. The corrective action was taken during the audit after we brought the matter to management's attention.

#### Use of Consultant Services

Two of the weapon system acquisitions had deficiencies reported on the use of CAAS. For example, Report No. 89-103, "Acquisition of the Patriot Missile," August 28, 1989, stated that the project office did not use two engineering support service contracts in accordance with DoD and Office of Management and Budget (OMB) policy. Personnel reductions led the project office to rely on the contractors to perform functions that were formerly performed by the project office. Some of the tasks under the contracts violated the provisions of DoD Directive 4205.2, and OMB Circular A-120, "Guidelines for the Use of Advisory and Assistance Services."

#### 4. LOGISTICS PLANNING

##### Overview

Deficiencies in logistics planning were identified on 7 of the 17 weapon systems acquisitions that were reviewed. The deficiencies in planning for logistics led to a variety of issues including insufficient training of personnel, inadequate funding for support, and inadequate technical data packages. The reports included recommendations to improve training equipment, obtain the appropriate funding levels for support equipment, and improve the quality of the technical data packages.

### Background -- Training

DoD Directive 1322.18, "Military Training," January 9, 1987, sets policy and procedures for training individual military personnel and units. The Directive requires that training programs be provided to effectively support required levels of force readiness and to efficiently use resources. The Directive also states that planning training support for new weapon and equipment systems, including the timely development and procurement of simulators and other training devices, shall be an integral part of the materiel acquisition process.

### Overview -- Training

Five of the seven weapon system acquisitions had problems related to training of personnel. As a result of the inadequate training, the operation and maintenance personnel for these five weapon systems were not adequately prepared to perform their assigned tasks.

Report No. 89-103 on the Patriot Missile System contained an example of inadequate training that resulted from poor planning. The U.S. Army Air Defense Artillery School had not adequately planned for the increase in the number of students because of the addition of a second level maintenance training requirement. The School had not planned for an adequate number of training devices for intermediate maintenance and had not provided for a sufficient level of maintenance and logistical support for the training devices. Increased training requirements, lack of sufficient training equipment, lack of sufficient repair parts, and projected loss of maintenance support for training equipment affect the School's ability to provide adequate training. Training deficiencies have an adverse effect on the operational readiness of the tactical units.

Report No. 90-021 stated that the Army needed to improve training programs for HEMTT operators. The initial operator training program was conducted without simulating actual cargo loads, and the training for operation of the self-recovery winch did not follow procedures described in the operator's manual. Both of these areas risked the safety of operators. The Army took immediate action to correct these deficiencies after we brought them to its attention. The report also stated that senior noncommissioned officers lacked the knowledge needed to ensure proper sustainment training of operators assigned to their unit. The achievement of a well-trained base of HEMTT operators would increase readiness and should reduce the number of accidents. We identified another example of a training deficiency in Report No. 89-030, "Acquisition of the Surveillance Towed Array Sensor System (SURTASS)," November 8, 1988. The report stated that the operating contractor failed to comply with contractual requirements for providing trained and cleared personnel. The contractor provided a civilian operating crew for

the Ocean Surveillance Ship (T-AGOS) that did not meet the contractual requirements for training or security clearances. Because of the low pay structure set up for the crew members, the operating contractor was not able to develop a labor pool of qualified personnel. The condition posed security and operational risks for SURTASS missions.

#### Background -- Depot Maintenance

DoD Directive 4151.16, "DoD Equipment Maintenance Program," August 23, 1984, states that an activity shall seek the most cost-effective method of achieving system readiness objectives. Additionally, DoD Regulation 7410.4-R, "Industrial Fund Operations," April 1982, prescribes regulatory guidance for the management of industrial funds. This Regulation prescribes the use of industrial funds for initial purchases of common stocklisted depot support equipment.

#### Depot Maintenance

Two of the seven weapon system acquisitions had problems resulting from poor planning for depot maintenance support. Both of these deficiencies could have been avoided if the funding decisions had been made earlier in the acquisition process. The failure to fund depot maintenance delayed the timely establishment of an in-house maintenance capability. For example, Report No. 89-059 "Acquisition of the C-17A Aircraft," March 20, 1989, stated that the Air Force did not budget for common support equipment (CSE) needed for depot maintenance of the C-17A aircraft. Headquarters, Air Force Logistics Command, did not act on the System Program Office's request for funding because it disagreed with DoD's and Air Force's regulations, which require that industrial funds be used for depot CSE purchases. Instead of using industrial funds, Air Force Logistics Command officials proposed to use appropriated funds to buy CSE for the C-17A program. Failure to fund initial CSE purchases threatened to delay the establishment of in-house depot maintenance for the C-17A and to force increased reliance upon costly interim contractor support.

We stated in Report No. 91-017, "Acquisition of the Tube-Launched, Optically-TRACKED, Wire-Guided Missile System," December 4, 1990, that the Sacramento Army Depot was unable to implement revised test procedures necessary as a result of an engineering change to a component of the Bradley Fighting Vehicle launch system. The engineering change specified that alterations were required to the instrument drive software to properly test the error detector cards. The Bradley Fighting Vehicle Project Office did not provide funding to the depot to implement the necessary changes to the test equipment. Without adequate funding, the depot stopped overhauling the error detector cards. To satisfy readiness objectives, the Missile Logistics Center, Redstone Arsenal, Alabama, issued the next higher assembly when the required item was not available. The next

higher assembly was much more expensive than the error detector cards.

## **5. CONFIGURATION MANAGEMENT**

### **Overview**

The OIG reported 11 configuration management issues on 7 of 12 weapon system acquisitions. We classified the problems as poor planning and failure to control configuration changes. The reports recommended improving the planning and control over weapon system configuration. Audits of 5 of the 17 weapon system acquisitions did not include coverage of configuration management issues.

### **Background**

DoD Directive 4120.3, "Defense Standardization and Specification Program"; DoD Instruction 4120.19, "DoD Parts Control Program"; and DoD Directive 4245.8, "DoD Value Engineering Program," contained the DoD policy and procedures for planning and controlling configuration management. These documents were canceled by the February 23, 1991, revision of DoD Instruction 5000.2. The configuration management policy is in DoD Instruction 5000.2, part 6, sections O, Q, and R. Additional management criteria are included in FAR, sections 43.102(b), 43.204(b), which discuss policy related to contract modifications and change order administration, respectively.

### **Configuration Management Planning**

Configuration management planning was weak for 7 of the 12 weapon system acquisitions reviewed. For example, Report No. 89-077 stated that the Navy finalized a specification to interface the Osprey aircraft engine and the infrared suppressor before the manufacturers of either system were chosen. This led the Navy to assume greater risks that the engine performance will not meet performance specifications.

We reported another example of inadequate planning in Report No. 90-002. The Army did not adequately pursue a material standardization and specification program to minimize life-cycle support costs of the M9 ACE. Failure to standardize the parts will result in additional repair parts unnecessarily entering the supply system.

### **Controls Over Changes**

Three weapon system acquisitions had weaknesses in the area of controlling changes to the configuration of the system. For example, in Report No. 89-042, "Acquisition of the Army's 5-Ton Truck," December 23, 1988, we reported that the program office did not follow procedures for approving engineering changes, have cost estimates for the changes available before approval, or

implement controls for timely processing. Also, the contracting office did not definitize contract modifications to add engineering changes within established milestones.

Also, Report No. 89-059 stated that as the design evolved, the weight of the C-17A aircraft increased from about 248,000 pounds to about 269,000 pounds. Aircraft weight is not a specification item, but analysis was required to determine the effects these weight changes had on the aircraft operational capabilities. Instead of making more design changes, the Air Force reduced the ferry range specification.

## **6. SCHEDULE**

### **Overview**

We reviewed scheduling on six weapon system acquisitions and found problems or potential problems on four systems. Recommendations were made during the audits, and management took corrective actions to improve schedules and adherence to schedules on the four weapon systems.

### **Background**

The DoD policy for establishing, maintaining, and monitoring Defense acquisition schedules is included in DoD Directive 5000.1, part 1.B.3, and DoD Instruction 5000.2, parts 11.A. and 11.C. These directives establish the framework for managers to use in developing schedule and resource requirements that are realistic and achievable.

### **Schedules**

Report No. 89-059 on the C-17A aircraft stated that the Air Force realized long delays in the initial operational capability date. These delays were caused primarily by budget reductions. Also, software development and integration may not have been completed in time to meet the schedules because the contractor and the project office underestimated the necessary development effort. In addition, during our review of the Mark XV Identification Friend-or-Foe System, we found that the contractor had not fully integrated the work schedule to identify items on the critical path. This, along with the addition of new staff members, vacancies, and overly optimistic planning schedules resulted in a cost and schedule variance. The contractor initiated action to integrate the work schedule and fill the vacancies. Even though corrective actions had been implemented, the program office expected the contractor to exceed the target cost. The program was subsequently terminated.

## **7. COMPONENT BREAKOUT**

### **Overview**

The OIG reviewed component breakout actions on 10 of the 17 weapon system acquisitions. We reported that component breakout should have been implemented on 6 of the 10 programs. The reports included recommendations for establishing policies and procedures that will ensure compliance with the DFARS 217.7202, revising acquisition plans to evaluate candidates for breakout, determining through analysis whether the components warrant breakout, and if appropriate, breaking out those components.

### **Background**

The purpose of component breakout is to purchase components at lower prices by buying directly from the manufacturer and avoiding the payment of indirect costs and profits to prime contractors. DFARS 217.7202 contains the DoD guidance on component breakout. The DFARS establishes the guidance and designates the responsibility for deciding whether components should be broken out and acquired directly from the manufacturer and furnished to an end item contractor as Government-furnished material for incorporation in the end item. DoD policy is to use component breakout if price competition is determined to be inadequate; substantial net cost savings will probably be achieved; and such action will not jeopardize the quality, reliability, performance, or timely delivery of the end item.

Breakout should also be considered whenever substantial cost savings will result from greater quantity acquisitions or from such factors as improved logistics support through reduction in varieties of spare parts.

### **Component Breakout Analysis**

In Report No. 90-002 on the ACE, we reported that the Army did not adequately pursue a detailed component breakout program. The project office performed a limited review of the production contract before contract award, but only the engine, final drive, and transmission were reviewed, and they were not broken out. In addition, the limited review was not properly documented to support either a favorable or an unfavorable breakout decision. The OIG reported that breakout of six selected components to the original equipment manufacturers would provide cost savings of about \$8.5 million to the Government during the program's remaining life.

Another example was cited in Report No. 89-104, "Acquisition of the MK-50 Torpedo Program," August 29, 1989. We reported that a component breakout analysis had not been made and that none was

planned for the MK-50 torpedo program. The Navy has subsequently performed the analysis and plans to implement component breakout when the program enters full-rate production.

Report No. 89-042, stated that component breakout of the Army's 5-ton Truck was not considered because the trucks were competitively procured. Additional cost savings may have been possible if some of the components had been broken out. We recommended that the Program Executive Officer for Combat Support Vehicles establish policy and procedures that future acquisitions comply with the FAR, section 17.7202, as supplemented by DFARS 217.7202. The Program Executive Officer for Combat Support Vehicles concurred with our recommendation.

## **8. WARRANTIES**

### **Overview**

Program offices were not aggressively obtaining and enforcing contractor warranties. The OIG examined warranty programs on 6 of the 17 weapon system acquisitions. The reports identified deficiencies in five of the six acquisitions. The deficiencies included inadequate preparation of the contract clauses for the warranties and failure to properly administer the warranties to recoup the appropriate consideration. The five audit reports recommended performing cost-effectiveness analyses of warranties to be included in contracts, determining whether administrative controls were in place to record and report warranty defects, and revising implementing instructions to clarify policy on warranty issues. The program offices initiated corrective actions that were generally responsive.

### **Background**

U.S.C., title 10, section 2403, which is implemented by DFARS 246.770, states that the head of an agency may not enter into a contract for the production of a weapon system unless each prime contractor for the system provides the Government with written guarantees that:

- (1) the item provided under the contract will conform to the design and manufacturing requirements specifically delineated in the production contract (or in any amendment to that contract);
- (2) the item provided under the contract, at the time it is delivered to the United States, will be free from all defects in materials and workmanship;
- (3) the item provided under the contract will conform to the essential performance requirements of the item as specifically

delineated in the production contract (or in any amendment to that contract); and

(4) if the item provided under contract fails to meet the guarantee specified in clause (1), (2), or (3), the contractor will at the election of the Secretary of Defense or as otherwise provided in the contract:

(A) promptly take such corrective action as may be necessary to correct the failure at no additional cost to the United States, or

(B) pay costs reasonably incurred by the United States in taking such corrective action.

#### Warranty Preparation

We identified three weapon system acquisitions that had inadequate warranty clauses in the contracts. The inadequate contract clauses resulted in warranties that were not cost-effective. Report No. 91-017 on the TOW stated that the Project Office established warranties with expected failure thresholds that were not cost-effective. This condition occurred because the Project Office did not use historical data on the TOW's warranty claims to determine the cost-effectiveness of warranties. As a result, the Army was not obtaining cost-effective warranties.

Another example of inadequate warranty clauses was described in Report No. 90-002 on the ACE. The Army established the warranty deductible thresholds at high levels, which lessened the opportunity for the Army to recover costs against the warranty. This occurred because the Army did not perform a cost-effectiveness review and analysis of the contractor's proposed warranty price before awarding the contract. The analysis is required by U.S.C., title 10, section 2403, and Army Regulation 700-139. As a result, the Army paid for warranty coverage without obtaining any real coverage against risks since the probability of reaching the failure thresholds was remote.

#### Administration Of Warranties

We reported deficiencies in the administration of warranty programs on three weapon systems. The problems included lack of control of warranty data, not meeting time limits for filing claims, and lack of an effective administrative system for reporting defects. For example, in Report No. 89-103 on the Patriot Missile, we reported that the Army had neither tested the missiles under warranty nor provided the 45-day written

notification to the contractor for all failures on the ground equipment and missile launchers, as required in the warranty clauses of the contracts. In addition, the Army had not returned all failed parts of the ground equipment and missile launchers to the contractor within 4 months of the failure, as required by the Warranty Implementation Plan. As a result, the contract included significant costs for warranties that were of negligible value because the warranties were not adequately implemented.

## **9. INTERNAL CONTROLS**

### **Overview**

Seven of the seventeen weapon system acquisitions reviewed had internal control deficiencies. The problems included not obtaining independent cost analyses or performing logistical reviews. The audit reports included recommendations to obtain independent cost analyses and perform logistical reviews, as required.

### **Background**

Establishing and maintaining an internal control structure is an important management responsibility. Good internal controls are essential to achieving the proper conduct of Government business with full accountability for the resources made available. They also facilitate the achievement of management objectives by serving as checks and balances against undesired actions. An entity's internal control structure consists of the policies and procedures established to provide reasonable assurance that the entity's objectives will be achieved. Internal controls should ensure that resources are used consistent with laws, regulations, and policies; resources are safeguarded against waste, loss, and misuse; and reliable data are obtained, maintained, and fairly disclosed in reports.

### **Internal Controls Deficiencies**

Seven weapon system acquisitions had internal control deficiencies. For example, in Report No. 91-005 on the Mark XV, the Air Force used the Navy Program Office's estimate instead of the independent analysis prepared by the Naval Center for Cost Analysis for the Navy's portion of the program. Also the joint program office adopted the Air Force's independent estimate as its estimate rather than updating its own joint program office estimate. This was counter to DoD Directive 5000.4, "OSD Cost Analysis Improvement Group," and DoD Instruction 5000.2, part 10.A. As a result, the Defense Acquisition Board could not adequately assess the independent and program office estimates.

Another example of an internal control problem was included in the Report No. 89-030 on the SURTASS. The SURTASS Program Office accepted and paid for inadequate drawings. The Program Office did not evaluate the drawings when they were delivered. FAR,

section 46.501, stipulates that the Government's acceptance of supplies or services from a contractor constitutes acknowledgment that the supplies or services conform to the contract's requirements. Cost savings that could have been realized from competition were reduced by about \$1 million because of inadequate drawings received.

**B. CONCLUSION**

Management of the acquisition of weapon systems is a complex challenge facing DoD managers. This report summarizes 80 issues, many of which occurred in multiple system acquisition programs. The OIG made 155 recommendations for corrective actions. From our analysis of these issues, we determined that most of the deficiencies resulted from the failure to comply with existing acquisition policy rather than from a lack of policy. Because of the dollar magnitude and potential impact on National Security, the management of weapon system acquisition remains an area needing continued emphasis, oversight, and improvement by DoD managers.

**C. MANAGEMENT COMMENTS**

Because this report did not contain any recommendations, no comments were required of management, and none were received. Therefore, we are issuing this report in final form. If you choose to comment on this final report please do so by March 16, 1992.

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**PART III - ADDITIONAL INFORMATION**

Appendix A - Reports In Audit Universe  
Appendix B - Summary Matrix Of Report Issues  
Appendix C - Report Distribution

APPENDIX A: REPORTS IN AUDIT UNIVERSE

<u>REPORT NO.</u>	<u>TITLE</u>	<u>DATE</u>
89-030	Final Report on the Audit of the Acquisition of the Surveillance Towed Array Sensor System	November 8, 1988
89-042	Acquisition of the Army's 5-Ton Truck	December 23, 1988
89-059	Acquisition of the C-17A Aircraft	March 20, 1989
89-075	Quick-Reaction Report on Operational Testing for the Single Channel Ground and Airborne Radio System	May 16, 1989
89-077	Acquisition of the V-22 Joint Services Advanced Vertical Lift Aircraft (OSPREY)	June 14, 1989
89-101	Acquisition of the Exoatmospheric Reentry-Vehicle Interceptor Subsystem	August 18, 1989
89-103	Acquisition of the Patriot Missile System	August 28, 1989
89-104	Acquisition of the MK-50 Torpedo Program	August 29, 1989
89-119	Acquisition of the Low Altitude Navigation and Targeting Infrared System for Night (LANTIRN)	September 29, 1989
90-002	Acquisition of the M9 Armored Combat Earthmover Program	October 6, 1989

APPENDIX A: REPORTS IN AUDIT UNIVERSE (cont'd)

<u>REPORT NO.</u>	<u>TITLE</u>	<u>DATE</u>
90-021	Acquisition of the Heavy Expanded Mobility Tactical Truck	December 26, 1989
90-032	Acquisition of an Army Special Access Program	February 2, 1990
90-042	Acquisition Management of the Small Waterplane Area Twin Hull Ocean Surveillance Ships	March 1, 1990
90-083	Air Force Special Access Program	June 8, 1990
90-094	Acquisition Management of the Single Channel Ground and Airborne Radio System	July 3, 1990
90-111	Development and Operational Testing for the Tube-Launched, Optically-Tracked, Wire-Guided (TOW 2B) Missile System	September 21, 1990
91-005	Acquisition of the Mark XV Identification Friend-or-Foe System	October 12, 1990
91-012	Development of the Ground Based Radar Program	November 9, 1990
91-017	Acquisition of the Tube-Launched, Optically-Tracked, Wire-Guided Missile System	December 4, 1990

**APPENDIX B: SUMMARY MATRIX OF REPORT ISSUES**

PME Audit System/Report	Testing	Program Management	Contracting	Logistics Planning	Configuration Management	Scheduling	Component Breakout	Warranties	Internal Controls	Program Totals
5-TON TRUCK (89-042)	-	-	-	-	X <sup>1/</sup>	-	X	X	-	3
C-17A (89-059)	-	X	X(2) <sup>2/</sup>	X	X(2)	X	-	X	-	8
V-22 (89-077)	X	X(2)	X	-	X(4)	X	-	-	-	9
ERS (89-101)	-	-	X(2)	X(2)	-	-	-	-	-	4
PATRIOT (89-103)	-	-	-	X(2)	X(2)	X	-	-	-	6
LANTERN (89-119)	-	X	-	-	-	-	X	-	-	1
M9 ACE (90-002)	X	X	X	-	-	-	X	-	-	6
HEMTT (90-021)	-	X(2)	-	-	-	-	X	-	-	4
CLASSIFIED (90-032)	X	X	-	-	-	-	-	-	-	3
SMATH T-AGOS (90-042)	X	-	-	-	-	-	-	-	-	4
CLASSIFIED (90-083)	-	X	-	-	-	-	-	-	-	3
SINGGARS (90-094)	X(2)	X	-	-	-	-	-	-	-	6
MARK XV IFF (91-005)	X	X	-	-	-	-	-	-	-	4
G8RP (91-012)	X	-	-	-	-	-	-	-	-	2
TOW 2 (91-017)	X	-	-	-	-	-	-	-	-	5
SINGGARS (89-075)	X	-	-	-	-	-	-	-	-	1
TOW 2 (90-111)	X	-	-	-	-	-	-	-	-	1
SURTASS (89-030)	X	-	-	-	X	-	-	-	-	3
MK-50 (89-104)	X(2)	-	X(2)	-	-	X	-	X	-	7
ISSUE TOTALS	14	13	12	8	11	4	6	5	7	80

<sup>1/</sup> AN X IN THE SPACE DENOTES THAT THERE WAS AN AUDIT ISSUE IN THAT REPORT.

<sup>2/</sup> A NUMBER IN PARENTHESIS BE SIDE THE X SHOWS THAT MORE THAN ONE ISSUE IN THAT CATEGORY WAS RAISED IN THAT AUDIT REPORT.

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APPENDIX C: REPORT DISTRIBUTION

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition  
Director, Defense Research and Engineering  
Deputy Director, Strategic and Theater Nuclear Forces  
Deputy Director, Tactical Warfare Programs

Department of the Army

Secretary of the Army  
Assistant Secretary of the Army (Financial Management)  
Assistant Secretary of the Army (Research, Development  
and Acquisition)

Department of the Navy

Secretary of the Navy  
Assistant Secretary of the Navy (Financial Management)  
Assistant Secretary of the Navy (Research, Development  
and Acquisition)

Department of the Air Force

Secretary of the Air Force  
Assistant Secretary of the Air Force (Acquisition)  
Assistant Secretary of the Air Force (Financial Management  
and Comptroller)

Defense Agency

Director, Defense Logistics Agency

Office of Management and Budget  
U.S. General Accounting Office,  
NSIAD Technical Information Center

Congressional Committees:

Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
Ranking Minority Member, Senate Committee on Armed Services  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
Ranking Minority Member, House Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Operations  
House Subcommittee on Legislation and National Security,  
Committee on Government Operations

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**Donald E. Reed, Director, Acquisition Management Directorate**

**Thomas Gimble, Deputy Director, Acquisition Management**

**Directorate**

**Thomas Hilliard, Acting Project Manager**